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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,537	12/05/2001	Kazufumi Ogawa	10873.255USD1	4182
23552	7590	02/03/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			HON, SOW FUN	
			ART UNIT	PAPER NUMBER
			1772	

DATE MAILED: 02/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/010,537

Applicant(s)

OGAWA, KAZUFUMI

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-11, 13-15, 17-20 and 22-73 is/are pending in the application.
- 4a) Of the above claim(s) 22-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-11, 13-15, 17-20 and 69-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/05/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1201, 0201. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 8-11, 13-15, 17-20, 69-73 in Paper No. 11032003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claims 8, 10-11, 13-15, 17-20, 69-73 are objected to because the term "suitable for use" when given the broadest interpretation implies that it can be used in devices other than a liquid crystal display. Appropriate correction or clarification is requested.
3. Claims 8, 10-11, 13-15, 17-20, 69-73 are objected to because the term "substrate" appears to incorporate the electrodes in claims 69-71, whereas in claim 73, the same term incorporates the resin film and another film, as well as the electrodes. Appropriate correction or clarification is requested.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 69, 8, 11, 70, 13-14, 71-73, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa (EP 0476 543), as evidenced by Willis et al. (US 5,266,222).

Ogawa has a liquid crystal alignment member for use in a liquid crystal display. The liquid crystal display has a first substrate provided with a first group of electrodes 11 in a matrix array, and a second substrate provided with a second electrode 15. Thereafter a silane-based surface active agent is chemically adsorbed on one or both electrode types (page 6, lines 25-35). The limitation of "substrate having a first surface and electrodes" is the substrate provided with the group of electrodes beforehand, and the surface of the group of electrodes is part of the first surface of the substrate as defined in the specification ("... electrodes being formed on surfaces of substrates, the alignment films being formed thereon", page 11, lines 15-25). Thus by teaching that the liquid crystal alignment film is formed on at least one of the electrode types, comprising a monomolecular film being formed of molecules (straight carbon chains) that have one portion bonded to the substrate by a covalent bond (chemically adsorbed to an electrode via a -Si-O-covalent bond) (column 3, lines 5-10), Ogawa meets the claim limitation of "a substrate having a first surface and electrodes; a monomolecular film formed on the first surface of the substrate" recited in independent claims 69-70. The hydrocarbon chains on the silane-based surfactant qualify the resultant polymer (a.k.a. plastic), formed from polymerizing the polymerizable groups on the surfactant molecule (column 4, lines 20-30), as a resin (claim 71). Thus Ogawa also meets the claim limitation of "a substrate having a first surface and electrodes; a resin film formed on the substrate" recited in claim 71.

Ogawa teaches that the molecules in the monomolecular alignment film are crosslinked in a state of alignment in a particular direction (column 2, lines 50-60). Thus the bonded

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molecules in the monomolecular film are aligned uniformly in a particular direction (claim 69). Although the molecules were not aligned by washing the molecules with a solvent after being bonded to the substrate and tilting the substrate in a desired direction to drain off the solvent, the molecules were aligned in a magnetic or electric field and subjected to an energy beam so that the energy beam sensitive groups (polymerizable groups) are reacted and crosslinked (column 3, lines 1-5) after being bonded (covalent bond) to the substrate (column 3, lines 5-10). Energy beams are sources of thermal energy. Hence the energy beam sensitive groups can also be thermoreactive groups which react to form crosslinks (claims 71, 20).

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). In the instant case, the product of Ogawa is a monomolecular film wherein the bonded molecules are aligned uniformly in a particular direction.

Ogawa teaches that the silane-based surfactant is chemically adsorbed on the electrodes either directly or indirectly via an insulating film (column 6, lines 25-35). Thus the resin film formed from polymerizing the polymerizable groups on the silane-based surfactant (column 6, lines 15-25) can also be formed on an insulating film over the electrodes, such that the substrate comprises a film between the resin film and the electrodes (claim 73).

Ogawa teaches that the molecules constituting the alignment film are formed by mixing a plurality of types of silane-based surfactants (surface active agents) (column 2, lines 50-60)

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which are chemisorption molecules, due to the application of the surfactants to the surface via chemical adsorption, as described in Applicant's specification (page 7, lines 20-25). The silane-based surfactants have different molecular lengths (long and short carbon chains) (column 4, lines 30-45). Applicant teaches that this combination of silane-based surfactants having different molecular lengths provide a film having concavities and convexities on the molecular level (page, lines 10-20) (claim 11).

Ogawa teaches that a portion of the silane-based surfactants may contain a carbon trifluoride group ($-\text{CF}_3$) functional group (column 5, lines 30-40). These different silane-based surfactants all have different critical surface energies, and provide a desired critical surface energy for the fixed film when mixed, as evidence by Willis et al.

Willis et al. gives the critical surface energy values of the film (column 10, lines 5-15) formed from mixtures of silane-based surfactants and fluoroalkyl functionalized ones (Fig. 1) and demonstrate that the fluoroalkyl functionalization changes the surface energy of the film, thus allowing control over the surface energy of the film.

Ogawa teaches the same types of carbon trifluoride group ($-\text{CF}_3$) (Ogawa, column 5, lines 30-40) functionalized silane-based surfactants as Applicant (specification, page 26, lines 5-15). Thus in the absence of a showing to the contrary, the monomolecular film comprising the mixture of silane-based surfactants and carbon trifluoride functionalized ones has a critical surface energy which overlaps the claimed range of from 15 mN/m to 56 mN/m.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 10, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa ('543) in view of Ogawa (US 5,849,369).

Ogawa ('543) has been discussed above and teaches the liquid crystal alignment member comprising a substrate comprising electrodes, and a monomolecular film formed on the surface, the monomolecular film formed of silane-based surfactant molecules bonded to the substrate by a covalent bond and are aligned uniformly on a specific direction. At least part of the chain includes a functional group for controlling a surface energy of the film.

Ogawa ('543), however, fails to teach that the molecules have Si at both ends or terminals.

Ogawa ('369) teaches a chemically adsorbed film on the surface of a substrate, comprising a silane-based surfactant (surface active agent) (column 1, lines 5-10). Fig. 5B and Fig. 6B show variations of the silane-based surfactant, and Fig. 6B shows molecules constituting the film with Si at both ends (claim 10) or terminals (claim 15). Ogawa ('369) thus demonstrates that silane-based surfactant molecules with Si at both ends or terminals are homologs of the silane-based surfactant molecules with Si at only one end or terminal in the invention of Ogawa ('543).

8. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishitaka et al. (US 5,725,915).

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Ishitaka et al. has a liquid crystal display (column 5, lines 1-5) comprising an alignment layer wherein the surface of the polymer resin film (column 5, lines 15-25) has striped concavities and convexities (Fig. 1) (valley-like concave and convex rows), wherein the concavities and convexities form parallel stripes as seen in the figure. The polymer resin is formed from a material (compound) wherein the energy beam sensitive groups and thermoreactive groups are introduced as side chain groups (the main chains are stable to UV light, and the side chains crosslink between the main chains) (abstract). The formula 2 (column 7, lines 15-65) of the polymer resin shows that the reactive double bond (vinyl group) is in the side chain, while the R_4 substituent on the side chain vinyl group is C_6H_4 which is a hydrocarbon group. The vinylic double bond crosslinks upon irradiation with an energy beam or heat, and is therefore both an energy beam sensitive group and a thermoreactive group.

The polymer resin film, which is the alignment layer, is formed on the electrode which is formed on the substrate (column 5, lines 1-15). A group of electrodes instead of one common electrode is an obvious variation of the art as evidenced by Ogawa ('543) which teaches a group of electrodes on one substrate of a liquid display (page 6, lines 25-35).

The limitation of "substrate having a first surface and electrodes" is the substrate provided with the group of electrodes beforehand, and the surface of the group of electrodes is part of the first surface of the substrate as defined in the specification ("... electrodes being formed on surfaces of substrates, the alignment films being formed thereon", page 11, lines 15-25).

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Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 9:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1300.


Sow-Fun Hon

01/23/04


HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

1/26/04